SYSTEM-SCALE HYDROPOWER PLANNING

FOR THE

INDUS BASIN, PAKISTAN

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Water Sector Capacity Building and Advisory Services Project

Pakistan: Humanitarian Snapshot - Floods (as of 2 Oct 2014)

OCHA

FLOODS

Flash and urban floods ravaged north-eastern Pakistan and western India when late and concentrated monsoon rains started on 4 September. As of 2 October, the floods caused 364 deaths and affected approximately 2.5 million people in Pakistan. In addition to the loss of life and injury, there has been a social and economic cost: the partial and total loss of homes, significant loss of livestock and livelihoods and massive crop damage. Authorities set up 527 relief camps in affected areas to provide immediate health care services, referrals, cooked food, water, and non-food items, such as tents, blankets, soap, and sleeping mats.

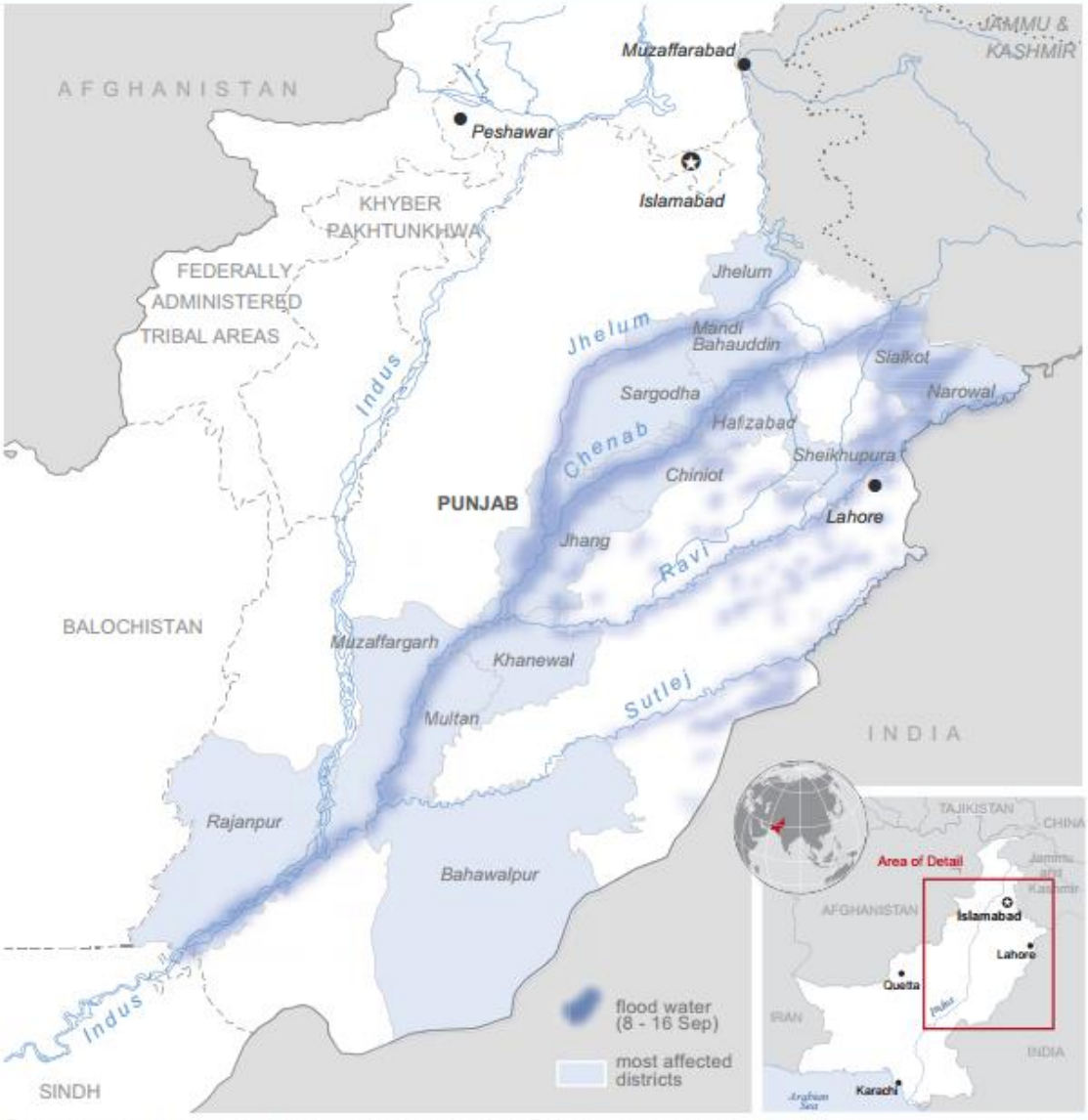
KEY STATISTICS[1]

2.53 million people affected

107,000 houses damaged

2.4 million acres crops affected

527 Relief camps

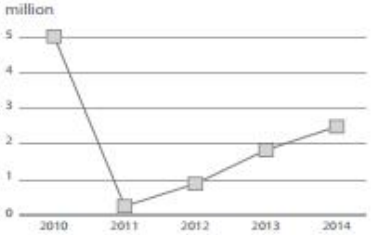


The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

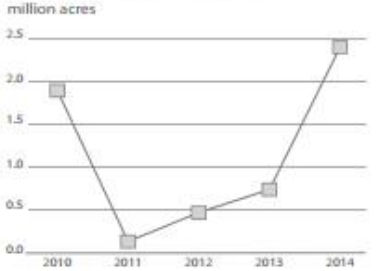
FLOOD HISTORY IN PUNJAB[2]

Recurrent monsoon floods over the last four years have affected more than 8 million people, many of them multiple times, leaving them vulnerable and in need of early recovery assistance.

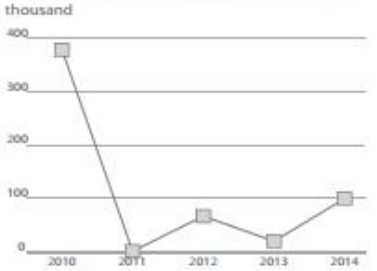
Number of affected people



Area of affected crop land



Number of damaged houses



Creation date: 2 Oct 2014 **Sources:** [1]NDMA Report - 2 Oct 2014. [2]PDMA Punjab OCHA Pakistan **Feedback:** ochapakistan@un.org **Web:** pak.humanitarianresponse.info


PAKISTAN
IN CRISIS

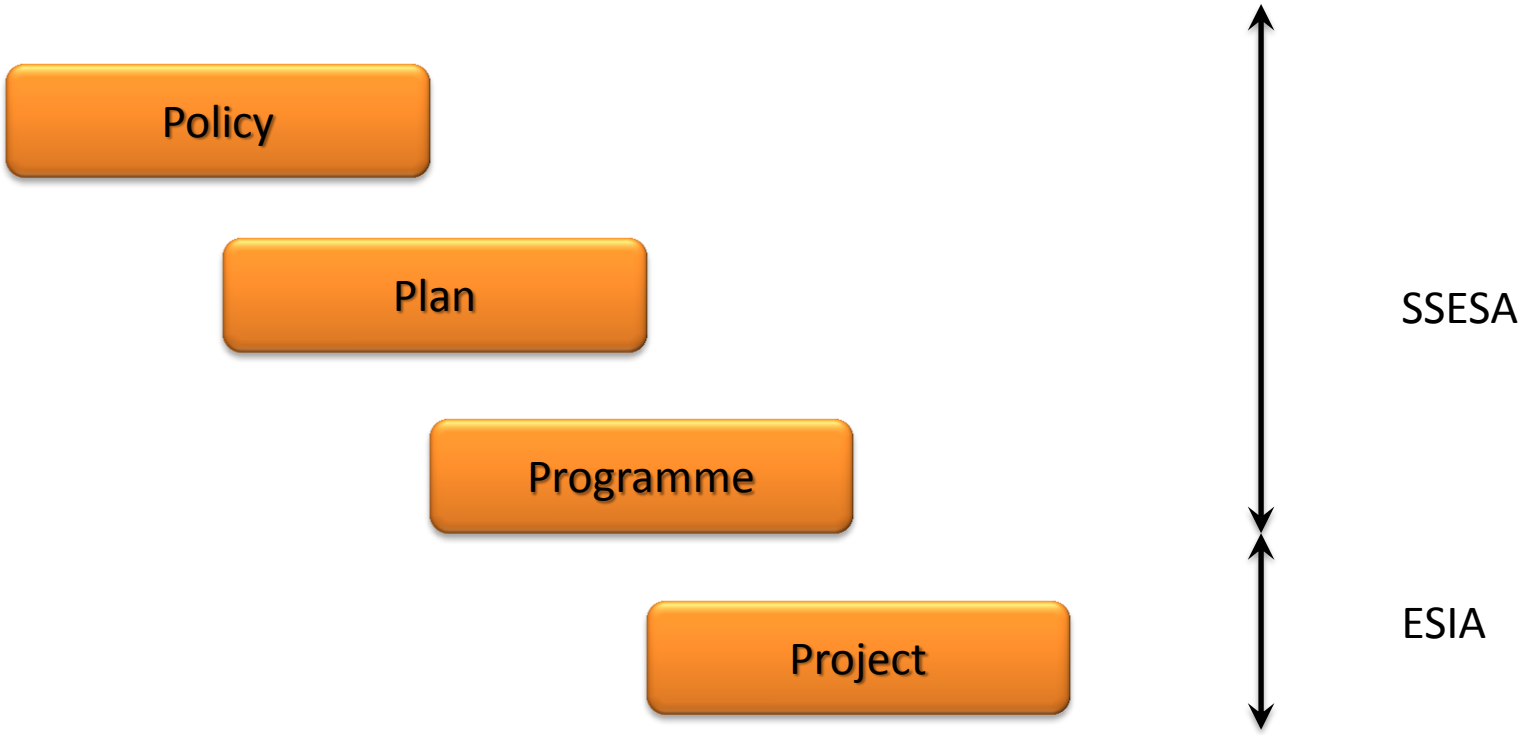
STRATEGIC SECTORAL ENVIRONMENTAL AND SOCIAL ASSESSMENT (SSESA) OF THE HYDROPOWER SECTOR IN THE INDUS BASIN

- In 2008, the Water and Power Development Authority (WADPA) announces "Vision 2025"
- Develop 80 billion cubic metres of water storage and add 37,770 megawatts of hydropower generation capacity by 2025
- Cost of implementation US$ 32.15 billion*

Challenge: Develop the program while meeting expectations to incorporate sustainability and social equity in a highly degraded system.

*(*up to $90 billion including privately funded projects)*

WHAT is SSESA?



METHODS

- A team of local and international technical specialists with expertise in the legal, planning, engineering, design, environmental and social disciplines

- Reviewed components of the existing HPP planning and development process, including:
  - institutional frameworks
  - policies
  - environmental and social resources of the Indus Basin
  - planning frameworks for hydropower development
  - cumulative impacts

- Extensive stakeholder consultation

FINDINGS

Policy

- Hydropower policy is in draft form
- Lack environmental/social provisions in laws/policies

Capacity Building

- Required in the areas of:
  - strategic policy formulation
  - project assessment

Compensation and Resettlement

- Not considered to be a high priority
- Past projects have stalled due to unresolved disputes

FINDINGS

Baseline Data

- Significant gaps exist in the existing dataset
- Lack of central database not conducive with informed decision making

Financial

- Losses of ecosystem services, climate change impacts/adaptation not considered
- Tendencies for funding disputes to delay projects

FINDINGS

Climate Change

- Hydropower is vulnerable due to reliance on water availability and security
- North Pakistan very susceptible to climate change impacts as it is influenced by three major weather systems:
  - sub-Mediterranean regime of mainly winter, westerly storms;
  - the Indian summer monsoon; and
  - the Tibetan anticyclone (Huntington, 2006)

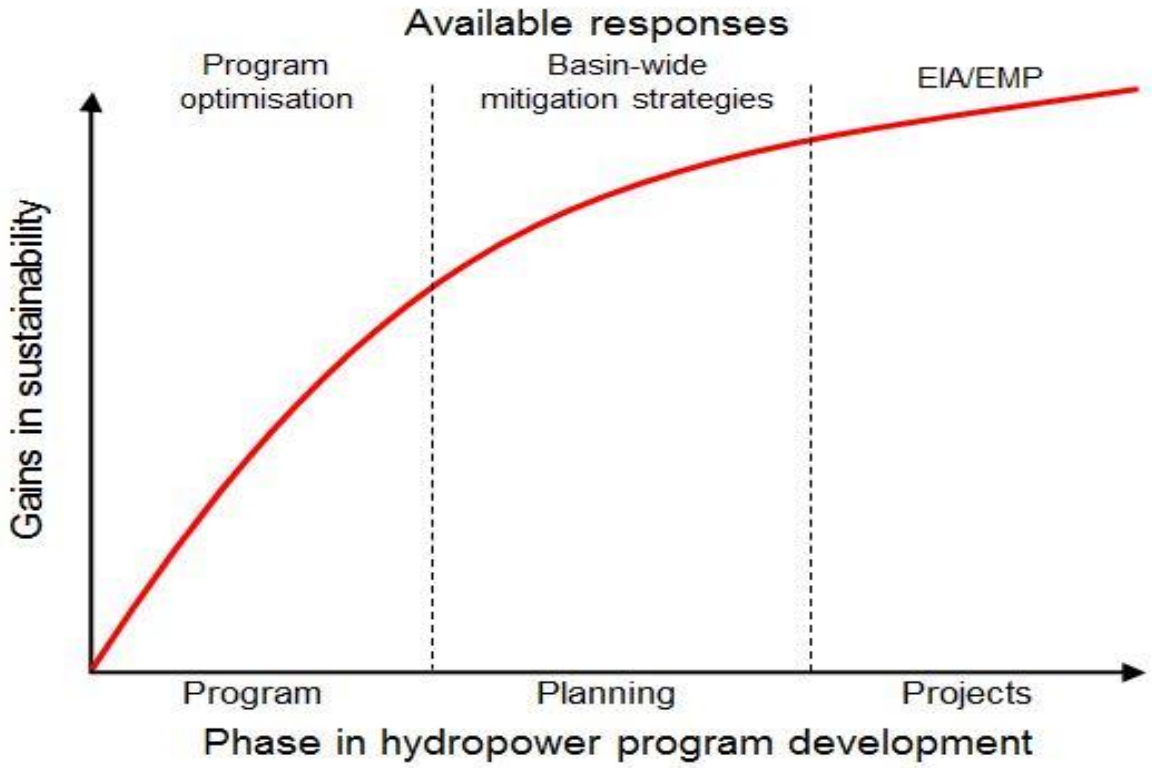
Intensity of catastrophic events is predicted to increase


China
Himalayan
Mountains
Pakistan
Harappa
Tibet
Mohenjodaro
Karachi
India
Arabian
Sea
Bay of
Bengal
Indian Ocean

CONCLUSIONS

Environmental and Social Impacts

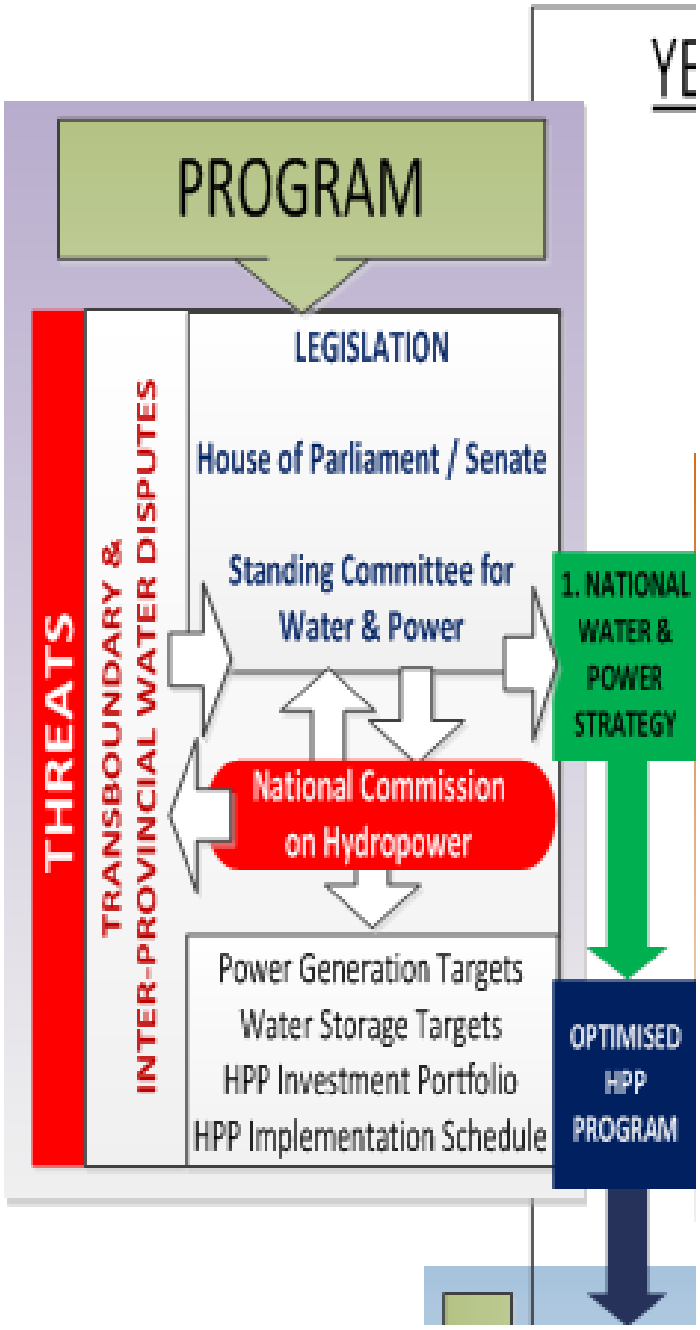
- Main cumulative impacts land loss and disruption of environmental flows
- Cumulative impacts best addressed a system-scale



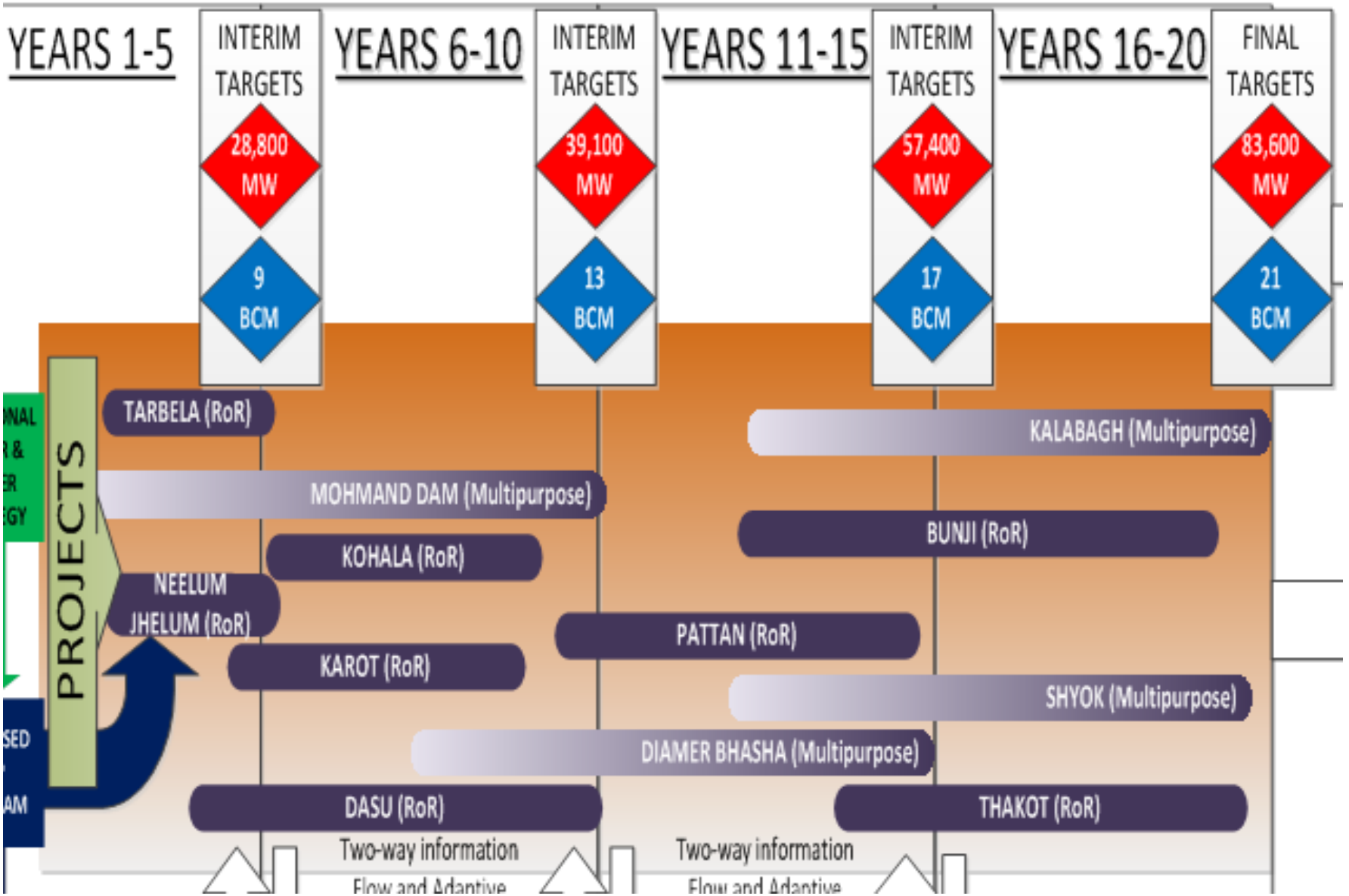
RECOMMENDATIONS

- Hydropower Program Optimisation (policy, targets, timeframes)
- Long Range Planning of Projects (interim water and power targets)
- System Level Strategies for Cumulative Impacts

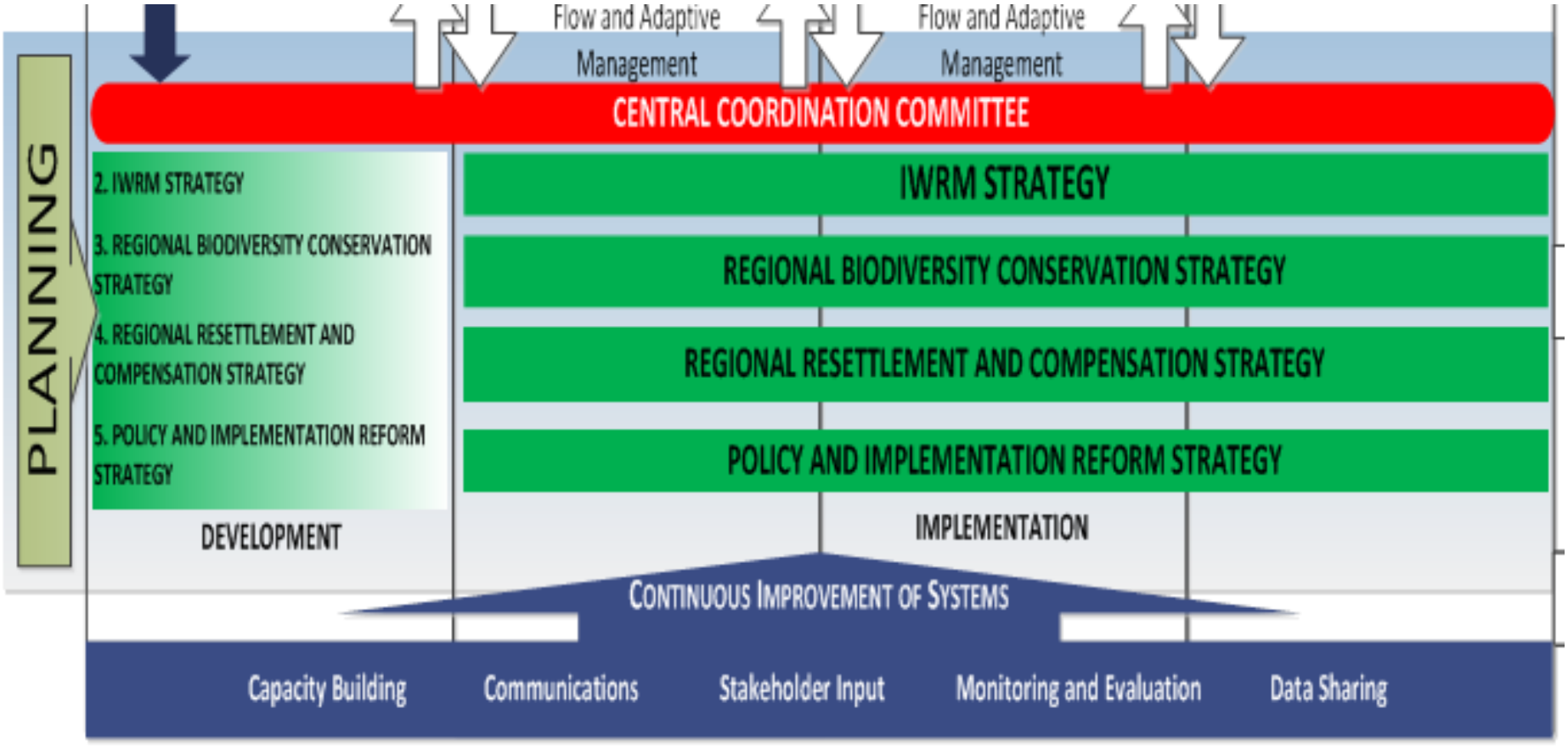
PROGRAM OPTIMISATION



LONG RANGE HPP PLANNING



SYSTEM LEVEL STRATEGIES FOR CUMULATIVE IMPACTS



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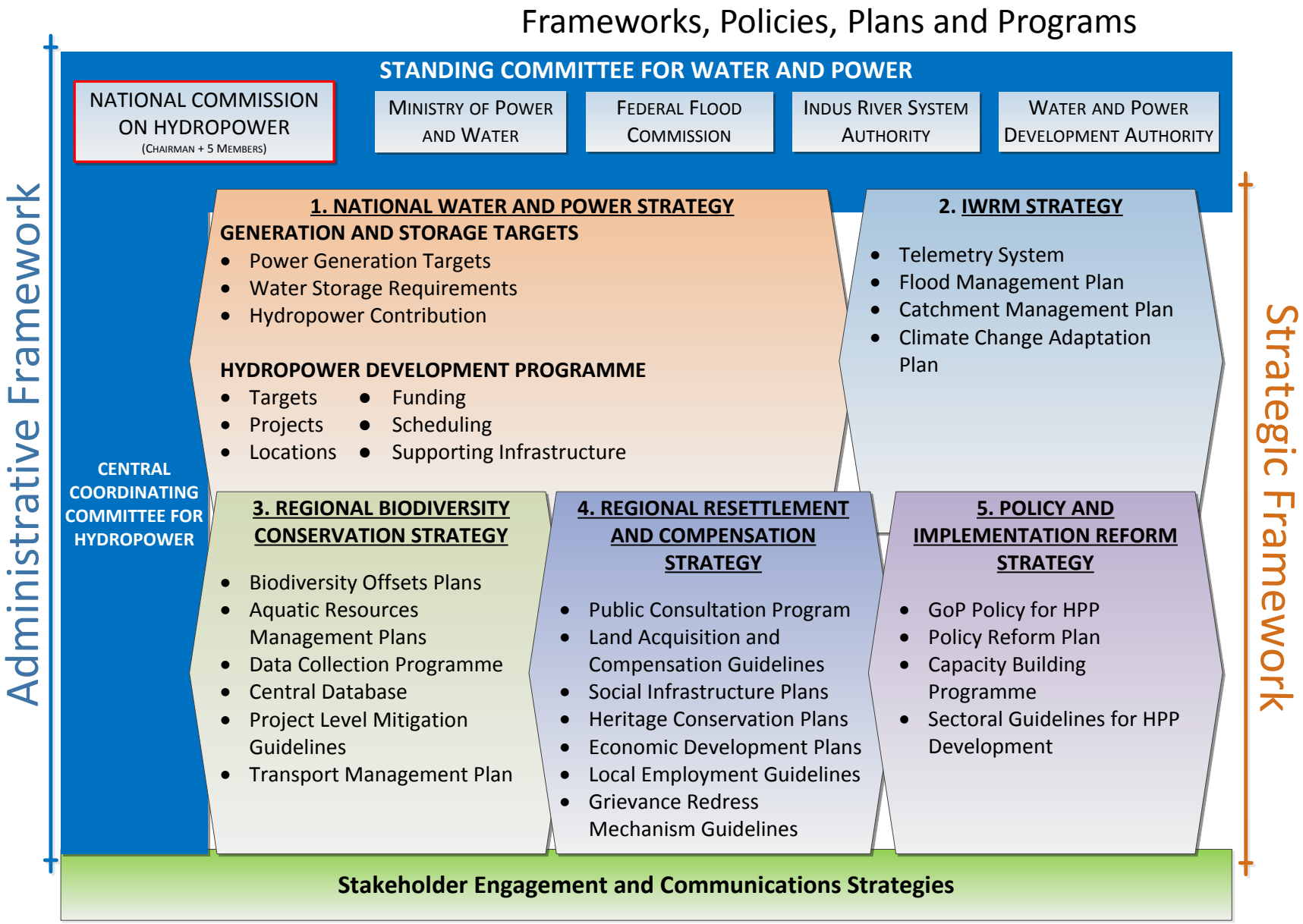

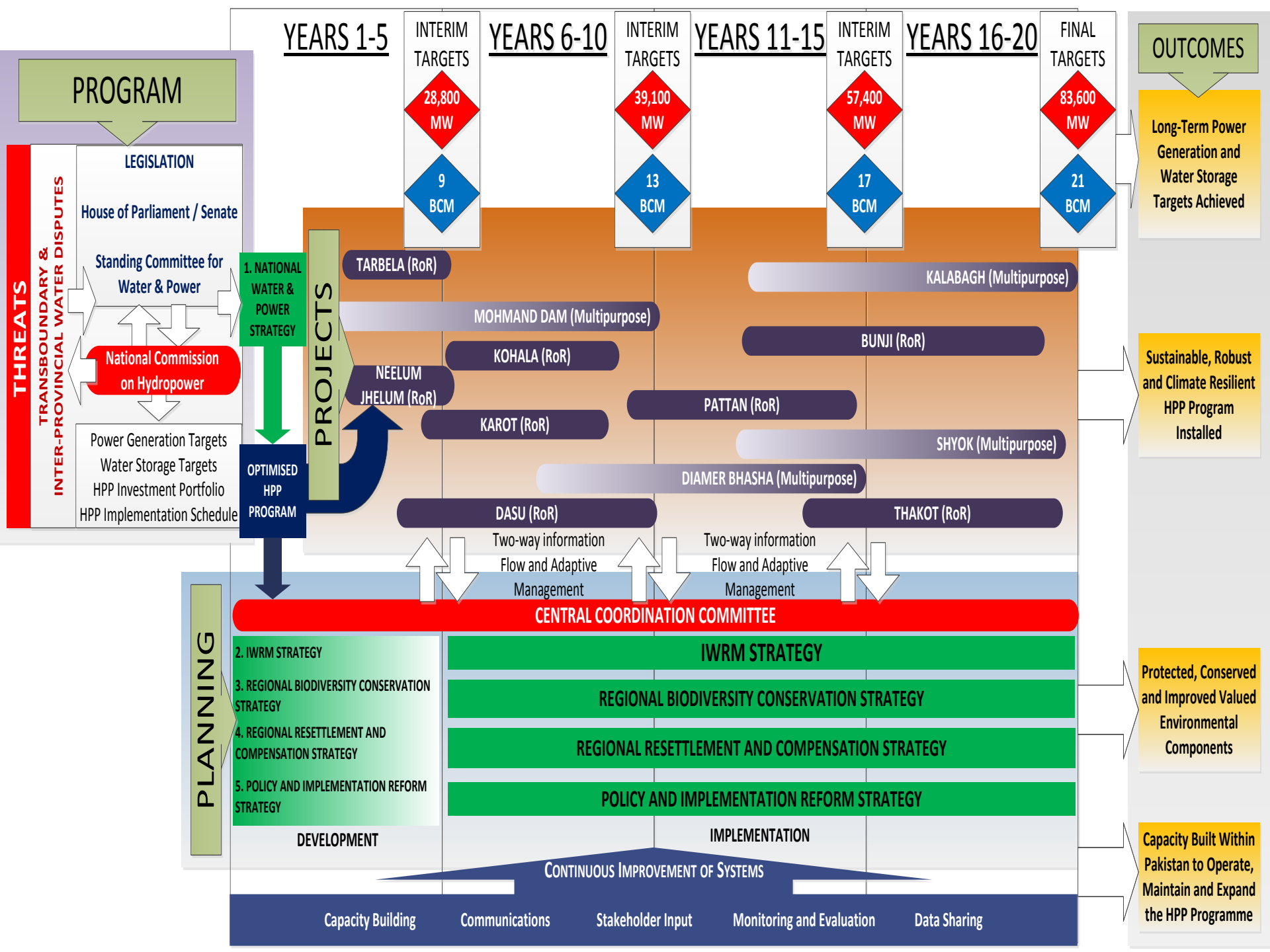
PROGRAM
THREATS
TRANSBOUNDARY & INTER-PROVINCIAL WATER DISPUTES
LEGISLATION
House of Parliament / Senate
Standing Committee for Water & Power
National Commission on Hydropower
Power Generation Targets
Water Storage Targets
HPP Investment Portfolio
HPP Implementation Schedule
1. NATIONAL WATER & POWER STRATEGY
OPTIMISED HPP PROGRAM
PROJECTS
YEARS 1-5
INTERIM TARGETS
28,800 MW
9 BCM
YEARS 6-10
INTERIM TARGETS
39,100 MW
13 BCM
YEARS 11-15
INTERIM TARGETS
57,400 MW
17 BCM
YEARS 16-20
FINAL TARGETS
83,600 MW
21 BCM
TARBELA (RoR)
KALABAGH (Multipurpose)
MOHMAND DAM (Multipurpose)
BUNJI (RoR)
KOHALA (RoR)
NEELUM JHELUM (RoR)
PATTAN (RoR)
KAROT (RoR)
SHYOK (Multipurpose)
DIAMER BHASHA (Multipurpose)
DASU (RoR)
THAKOT (RoR)
Two-way information Flow and Adaptive Management
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CENTRAL COORDINATION COMMITTEE
PLANNING
2. IWRM STRATEGY
3. REGIONAL BIODIVERSITY CONSERVATION STRATEGY
4. REGIONAL RESETTLEMENT AND COMPENSATION STRATEGY
5. POLICY AND IMPLEMENTATION REFORM STRATEGY
DEVELOPMENT
IWRM STRATEGY
REGIONAL BIODIVERSITY CONSERVATION STRATEGY
REGIONAL RESETTLEMENT AND COMPENSATION STRATEGY
POLICY AND IMPLEMENTATION REFORM STRATEGY
IMPLEMENTATION
CONTINUOUS IMPROVEMENT OF SYSTEMS
Capacity Building
Communications
Stakeholder Input
Monitoring and Evaluation
Data Sharing
OUTCOMES
Long-Term Power Generation and Water Storage Targets Achieved
Sustainable, Robust and Climate Resilient HPP Program Installed
Protected, Conserved and Improved Valued Environmental Components
Capacity Built Within Pakistan to Operate, Maintain and Expand the HPP Programme